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BRAZIL'S CASHEW INDUSTRY FORGES AHEAD

Commercial development of Brazil's cashew nut crop as an adequate source of supply for the United States will depend on the installation of sufficient shelling machinery in the postwar period.

Adequate machinery will make it possible for Brazil to compete with the low-cost labor of India, now the principal source of cashew nuts for the United States and the rest of the world.

American experts are of the opinion that Brazil should take advantage of the present high prices created by the war and train technical workers and harvesters. Eventually, if Brazil's harvest is sufficiently increased, she will be able to supply all the needs of the United States. The potential annual supply of cashew nuts in the Western Hemisphere greatly exceeds the 80,000 to 100,000 tons processed in India per year.

The Irvington Varnish and Insulator Company, of Irvington, New Jersey, and the Brasil Oiticica, S.A. of Fortaleza, Ceará, are now engaged in processing cashew nuts in Brazil. The Irvington Company's Brazilian plant, known as the Industrias Agroquimicas do Brasil, S. A., was established in Fortaleza, in 1941, and is capable of processing 3,000 tons per year.

Equipment for processing cashew nuts could be built in São Paulo at a cost not exceeding $10,000. Experiments show that with the exception of the sorting table, other mechanical units already give 100 percent results. A volume of at least 1,500 tons of nuts per year is required for operation on a commercial scale.

Now that restrictions on the importation of cashew nuts have been removed, Brazil can count on the United States as a profitable market for broken kernels, which are especially used by candy manufacturers and bakeries. India, it is expected, will continue to maintain her monopoly of the market which caters to the American housewife who prefers whole kernels for home table use.

Prices for Whole Kernels

The average price for Indian whole kernels between the years 1930 and 1940 ranged between 18 and 20 cents per pound F.A.S. New York, and the average price for broken kernels was between 13 and 15 cents per pound.

Cost studies indicate that Brazilian broken kernels can be laid down in New York for about 9 cents per pound, as compared with 15 to 20 cents per pound for whole kernels from India. This price should open new markets for broken kernels.

Cashew nuts are native to the northeast coast of Brazil and are being produced in commercial quantities in Bahia, Pernambuco, Ceará, and other states in the northeastern section of the country.

Aside from the oil from the cashew nut and shell, by-products include the raw fruit, the juice, which is made into wine, and the preserved fruit.

Source of Chemurgic Phenol

Cashew nut shell liquid is an economical source of chemurgic phenol, extensively used in the plastic industry, and in the preparation of varnish for transformer coils, armature windings, the insulation of airplane ignition cable, and other electrical apparatus. In the brake lining field it is an ideal friction-fortifying agent. Resins derived from the formaldehyde treatment of cashew nut shell liquid are soluble in mild petroleum naphthas. Even when baked the material possesses a surprising resiliency.

In 1940 the United States imported 203,100 pounds of cashew nuts, valued at $24,472, from Brazil. In the same year imports from India were 28,667,097 pounds, valued at $4,059,156; Ceylon exported to the United States 49,750 pounds valued at $7,108; and Haiti exported 13,964 pounds, valued at $1,989.

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MORE BRAZILIAN JUTE NOW PRODUCED FOR COFFEE BAGS

One of the most interesting developments that has taken place in Brazil in recent years, according to an article in "Agriculture in the Americas," is the increase in the production of jute fiber to meet the demand for bags and burlap necessary for the marketing of coffee and other agricultural products.

Originally Brazil imported most of its jute from India but importation of the fiber has been curtailed by the war. As a result Brazil has turned to the use of substitute fibers and to the cultivation of jute at home. The Brazilians have been so successful in cultivating the fiber that substantial amounts are being produced and increasing quantities of jute products are being exported to the United States.

Both the plant and fiber are designated as *juta* in Portuguese, *yute* in Spanish, and *jute* in French, German, and English. There are two species: The *Corchorus capsularis*, or round-pod jute, with small brown seeds, and the *Corchorus olitorius*, or long-pod jute, with long, small, bluish-colored seeds. Both species are annuals, and they look so much alike that it is difficult to distinguish between them except by the pods and seeds. One is usually grown in river valleys, the other on higher ground. Both require a fertile soil and a warm, wet climate.

Recent Developments

Constant experimentation has produced fiber that has been marketed under such varying names as Oyama, Parintins, Santarém, Amazon, and Brazilian. Most of the jute grown in India and all that cultivated in Brazil is the *Corchorus capularis* or round-pod jute. The Brazilian varieties developed from seed brought from India.

Before the war, the Government granted special concessions to the Japanese growers, who expanded their Parintins plantings and established a second important center at Santarém. When Brazil entered the war, the Japanese organization was taken over by Government authorities together with most of the lands owned by individual Japanese. Brazilian capital is now invested in the industry. Prices are favorable because of wartime shortages. Cultivation in Espirito Santo is progressing well, and about 875,000 pounds of fiber may be realized from the 1944 crop.

The most important area of jute production in Brazil is a narrow strip of alluvial flood lands extending for many miles along the banks of the Amazon River and several of its tributaries from the Colombian boundary to the Atlantic Ocean. The greatest concentration of plantations is around Santarém, Jurity, Obidos, Parintins, and Manaus. The total area is about 16,000 acres. A field can be planted to jute for two or three successive years, then it is abandoned to the jungle, and new land is cleared. Such procedure will be necessary until a satisfactory system of crop rotation can be worked out.

Cultivation of Jute

Cultivation and preparation of the fiber require an abundant supply of labor. In India all the work is done by hand and for each square mile of land approximately 1,000 persons are required for the production and marketing of the crop. Wages there were low enough, however, to permit medium-grade jute fiber to sell at an average of 4 to 4.5 cents per pound on the New York wholesale market during the last five years before the outbreak of war.

In the Amazon Valley a plantation consists of many small areas, frequently located on higher patches of ground like small natural levees surrounded by water. The worker has to go to his field and from one patch to another by boat. This condition, as well as the small size of the fields, their isolated location, and the prevalence of stumps and brush left by clearing, makes impossible the use of machines.

In Espirito Santo, upland areas are prepared with tractor plows and disc-harrows, the seed is planted with mechanical seeders, the stalks are cut with power harvesters, and retting takes place in tanks built for the purpose. After the retting, however, the preparation of the fiber must be done by hand.

Lowland Cultivation

Lowland cultivation is picturesque but involves hard labor and disagreeable working conditions. All work is determined by the rainy seasons. Clearing of the land takes place in time for the brush to be burned during the driest season, usually October and November, and the soil to be prepared and the seed to be planted before the rainy season begins. Delay in planting results in insufficient time for growing before the floods come. The crop requires about 120 days to mature, and only three or four months elapse between the first rains and flood waters high enough to threaten any crops still standing. Little care is necessary during the growing season, since the rapid growth soon chokes out weeds and grass.

Jute stalks grow tall and slender. When the plant is about 6 or 12 feet high, small yellow flowers appear and serve as heralds of harvest time. The fiber is obtained from the inner bark and belongs to the bast fiber group which includes ramie, flax, and hemp. The clean fiber is soft and long, but not as strong as hemp, flax, or cotton.

The harvest season is short and scarcity of labor at this time may result in great loss. Many farmers begin harvesting their crop soon after the flower buds appear and continue cutting as long as the rising water permits. This practice results in great variation in the quality of fibers and increases grading problems. The stalks are cut several inches above the ground and tied into bundles which are then weighted down under water for retting.

The retting process consists of soaking the stalks until the tissues surrounding the fibers have become so softened that they can be scraped and washed away, leaving only the clean fiber. Careful judgment in timing is necessary in order to obtain a fiber that is thoroughly clean without being weakened by over-processing.

Cleaning is always done by hand, and from late March through June workers are often seen standing waist high in water and beating long bunches of fiber into the water to remove all waste material. In higher regions where the fiber is processed on dry ground the women help to scrape and carry it to nearby streams for washing. Both women and children spread the clean fiber on long racks in the sun and care for it during the drying stage. Great care is necessary in this work, as improperly dried fiber deteriorates in color and strength and sells on the market at reduced prices.

Two crops may be produced each year. The first harvest usually occurs between late March and the end of June. The second crop is planted immediately and is ready for harvest in October or November.

Jute Workers

There are now in the Amazon Valley about 5,000 families consisting of approximately 30,000 persons who are engaged in growing jute either as independent farmers or as hired laborers. Two types of farms are common in the region. The larger ones are usually owned or leased by businessmen, often merchants of nearby cities, or firms who hire laborers to clean the land, plant the seed, harvest the crop, and process the fiber. Wages vary with the type of work, and are relatively good, but last only through the working season. The smaller farms are owned and tended by individual farmers. A man with his family can handle a crop of from two to five acres of jute without outside help.

Use of Jute in Brazil

Before the present war, jute fiber worth $3,000,000 a year was imported into Brazil for manufacture. Most of it was shipped directly into the State of São Paulo, which is the center of the jute textile-manufacturing industry of the country. Here it is manufactured into burlaps, hessians, and bags to be used as containers and wrappings for coffee, sugar, grain, cocoa, potatoes, babassú kernels, castor beans, feed, fertilizers, wool, cotton, and other farm products. The coffee crop alone requires about 15,000,000 bags each year, and in pre-war years the number was even greater. Jute is also used in the manufacture of rugs and carpets and for cloth for the backing of linoleum and oilcloth.

Jute on the Market

Although the cost of producing a pound of jute in Brazil is estimated at from 3 to 4 cents per pound, the consumer must pay considerably more than this, since the expense of transportation over the long distances from the plantations to the mills is often as great as the production cost. The fiber is sold on the market according to samples, because standardization of quality has not been completely established. An official service, started in 1941, involving specifications for designated classifications of fiber, has helped considerably toward establishment of standards, which should be a large factor in the increasing success of Brazil's jute industry.

BRAZIL MAY BECOME SECOND LARGEST PRODUCER OF CORN

Brazil, the world's third most important producer of corn, yields about five and a half million tons per year. This volume is exceeded slightly by Argentina, which ranks second. The United States holds first place.

Possibilities of increasing the output of Brazilian corn are vast. The grain is raised throughout the country, but usually only in sufficient quantity to supply local needs. Before World War I, Brazil still imported corn for local consumption. In 1913, for example, 8,893 tons of unmilled corn and 384 tons of corn flour were imported. Then she began to export.

The year 1938 was an exceptional one for the export of corn from Brazil. The biggest markets in that year were Great Britain, which purchased about 14 percent, and Holland which took about 12 percent. In 1942 about 55½ percent was shipped to Switzerland and 38½ percent to Portugal. In 1943 exports dropped to 392, of which approximately 93 percent went to Bolivia.

The States of Minas Gerais and São Paulo furnish about 53 percent of the total national production of corn. São Paulo contributes the larger share for export, while Minas Gerais consumed its entire production. Corn is the main diet of hogs, and Minas Gerais, incidentally, has the largest number of hogs in the nation. Brazil itself is the world's third largest raiser of hogs.

After Minas Gerais and São Paulo, the states in Brazil producing the most corn are: Rio Grande do Sul, which produces approximately 17 percent, Paraná with 6 percent, and the State of Rio de Janeiro, with approximately 5 percent. These five states account for no less than 81 percent of the national output.

Corn destined for export is already standardized. It must not contain more than 15 percent of moisture.

The United States grows the largest crops of corn in the world, leading with 65-70 million tons a year. In the absence of definite figures regarding China at the moment, Argentina rates next on the corn market. It is closely followed by Brazil, whose production in the last six years is shown as follows:

	Total Yield	*Exports*
1938	5,599,836 tons	125,490 tons
1939	5,393,553 "	72,149 "
1940	4,744,741 "	28,765 "
1941	5,088,805 "	3,546 "
1942	5,515,997 "	9,693 "
1943	———	392 "

It can be seen that only about 1% of the total production of corn has been shipped abroad since 1938.

As soon as Brazil secures a steady foreign market for her corn, she should be able to out-produce Argentina.

NATIONAL HIGHWAYS LINK BRAZIL

A vast network of highways is beginning to crisscross Brazil from all four points of the compass, in accordance with the National Highway Plan approved March 20, 1944. In this prodigious undertaking the total mileage of the highways envisaged is slightly over 24,000. This means that if all the network were laid out in one straight road, it would fall but a few hundred miles short of reaching round the world.

The plan divides the contemplated highways into three groups: those running generally from north to south, those traversing the country from east to west, and a smaller group of connecting roads. The longest single stretch will be the Getulio Vargas Highway, extending 3,822 miles from Belém to Jaguarão; next in length is the Transbrasiliana, 3,054 miles, from Belém to Livramento.

In working out the plan, the Highway Commission sought wherever possible to avoid the placement of highways along principal rail routes, either already existing or under construction; to take advantage of existing or planned state highways; and to establish in the interior of the country convenient connecting links with railways and air routes. Another main object was to correct the tendency of the past to extend communication routes fanwise and in separate networks from coastal cities into the hinterland. When all the newly planned roads are completed, Brazil will have a single coordinated highway system that will make hitherto remote areas easily accessible and that will be of enormous value to the nation from the economic, administrative, military, and tourist standpoints.

Length of Brazilian Highway System

According to the records of the Brazilian Institute of Geography there were 258,390 kilometers of roads as of January, 1940. Applying the figures relating to the area of Brazil, and those of the Census of 1940, a comparison can be made relating to the length of the roads and the respective area and population of the various states.

Pan American Highway

Brazil has to construct the following sections of this important undertaking: Rio-Porto Alegre-Jaguarão (frontier of Uruguay), Porto Alegre-Uruguaiana and São Lourenço-Bagé-Aceguá. The Rio-Porto Alegre-Jaguarão section will be completed within two years, and will shorten the present distance by 250 kilometers.

It is also planned to connect Rio de Janeiro with La Paz, Bolivia, as follows: Rio-Caxambú-Cuiabá frontier of Bolivia towards Santa Cruz de La Sierra-La Paz, being for the Bolivian Government to fix the route from the frontier to La Paz.

Highway Projects in the Northeast

During the past 10 years the Federal Drought Control Department has constructed roads which have been of great use in their work of aiding the drought-stricken regions. The road between Fortaleza and Terezina has been completed, being 604 kilometers in length. In the States of Bahia, Pernambuco and Ceará other roads are under construction.

Highways of Brazil

STATES	*Area (sq. km.)*	*Population in 1940*	*Motor Roads in 1940 (Km.)*
NORTH:			
Acre	148,027	81,326	—
Amazonas	1,825,997	453,233	422
Pará	1,362,966	956,870	1,922
NORTHEAST:			
Maranhão	346,217	1,242,721	4,149
Piauí	245,582	826,320	7,480
Ceará	148,591	2,101,325	10,423
Rio Grande do Norte	52,411	774,464	6,180
Paraiba	55,920	1,432,618	4,091
Pernambuco	99,254	2,694,616	5,606
Alagoas	28,571	957,628	2,636
EAST:			
Sergipe	21,552	545,962	820
Bahia	529,379	3,938,909	12,652
Minas Gerais	593,810	6,798,647	42,410
Espírito Santo	44,684	758,535	5,536
Rio de Janeiro	42,404	1,862,900	4,363
Distrito Federal	1,167	1,781,567	516
SOUTH:			
São Paulo	247,239	7,239,711	51,705
Paraná	199,897	1,248,536	15,461
Santa Catarina	94,998	1,184,838	15,536
Rio Grande do Sul	285,289	3,350,120	36,785
MIDDLE WEST:			
Goiás	660,193	832,869	15,806
Mato Grosso	1,477,041	434,265	13,701
BRAZIL	8,511,189	41,565,083	258,390

BRAZIL TO START REPAYMENT OF LEND-LEASE

By her payment in March of $35,000,000 to the United States Treasury, covering the first three installments for materials received under Lend-Lease programs, Brazil becomes the first Latin American country to start settlement of its Lend-Lease obligations to the United States.

The exact total of Lend-Lease loans to Brazil, and other countries as well, has not yet been publicly revealed for security reasons. Two agreements, however, were signed with Brazil. The original, arranged October 1, 1941, is said to have provided for total aid of $100,000,000, primarily in the form of materials for construction of defense bases at Natal on the Brazilian bulge and other sections. The second, signed March 3, 1942, provided for an additional $100,000,000 to speed Brazilian armament and defense.

Brazil is supposed to have received "more than one-half" of Lend-Lease shipments to Latin America, which up to December 1, 1944 amounted to $207,700,000, according to the latest quarterly report to Congress.

WAR DEMANDS EXPAND BRAZIL'S RAILROADS

The task of carrying the tremendous load of strategic materials destined for the United Nations' war effort has greatly expanded Brazil's network of railroads.

Shortages of shipping space as well as the submarine menace made it necessary to ship large amounts of materials by rail instead of by coastwise vessels. In fact, in Brazil many of the coastwise carriers were sunk in the early months that followed Pearl Harbor.

Consequently, the Brazilian railroads, wherever possible, had to take over the burden of transporting foodstuffs, fuel, and other essentials to maintain the domestic economy, as well as strategic materials for export.

Shortages of gasoline, tires, and replacement parts—which cut down bus, truck and automobile transportation—added to both the passenger and freight traffic load of the railroads.

On top of this came the flood of raw materials arising out of the huge development and purchase programs launched to supply the ever-increasing needs of the United Nations' war industries.

Finally, the railroads were called upon to transport materials and personnel in connection with the building, maintenance, and supply of large military, naval and air bases.

Early Difficulties

Railroads in Brazil had difficulty obtaining fuel and had to resort to wood, corn and other substitutes for coal and oil. Even such railroads as those in the State of São Paulo, which customarily use 18,000 cubic meters of wood per day, had difficulty because supplies of wood near their rail lines had become depleted. In some instances, Brazilian railroads were using as much as 40 percent of their rolling stock in assembling and distributing wood fuel.

In Brazil, work progressed on the rehabilitation of the 348-mile railway operating from the Itabira iron mines through the mineral-rich Rio Doce Valley to the port of Vitoria.

About 100 miles of this railroad have been relocated by the United States and Brazilian engineers with the aid of part of a $14,000,000 Export-Import Bank of Washington loan plus $10,000,000 contributed by Brazil to date. These funds also were employed to erect modern facilities at the port of Vitoria to expedite iron ore loading and dispatch of iron ore freighters. Twelve locomotives and 250 ore cars from the United States were delivered to this railway in 1943.

The Brazilian Government has given the United States and British governments preferential rights for the purchase annually of 750,000 tons of iron ore each for three years. The Caué Peak mountain in this region is said to be the largest single hematite iron ore deposit in the world. The Rio Doce Valley also yields mica, rock crystal and other minerals needed for the war effort. Extensive economic development of this region has been planned by Brazil.

The pattern of inter-American cooperation also has been followed by the United States Government in releasing for export and granting shipping priority for delivery of certain essential railroad equipment to other railroads besides the Vitoria and Minas Railway in Rio Doce Valley. This was done in cases where railways could not function in transporting vital war material without receipt of railroad materials and equipment from the United States. Lend-Lease is in no way involved in any railroad transaction in the other Americas.

Brazil's Federal-and-State-owned Sorocabana Railway is being equipped with 20 electric locomotives and switching equipment from the United States, whose purchase has been facilitated by credits from the Export-Import Bank of Washington. The electrification of this railway has been pushed despite wartime obstacles. Lacking sufficient quantities of coal, the railway, like many others in Brazil, has been using wood for fuel. In 1940 the Sorocabana Railway contracted with a United States-Brazilian group for electrification of 90 miles of its main double track line between São Paulo, largest manufacturing center of Brazil, and the city of Santo Antonio. The electrification project is expected to cost about $10,000,000 and is the largest under way in the other Americas.

Although Brazil's lack of north-south rail connections made her economy especially vulnerable to the Axis submarine campaign, the plight she found herself in when coastwise shipping was suddenly crippled was not unique. By and large, rail connections, both international and internal, have been insufficient in the other Americas, by United States, Canadian or European standards.

* * *

PLAN MORE MODERN SHIPS FOR BRAZIL

Postwar plans for new, faster, more modern passenger ships to Brazil are already under way, according to the annual report of the Moore-McCormack Line, operators of the Good Neighbor fleet to the East Coast of South America. Plans also call for additional cargo ships for the same service.

The Company indicated, however, that it expects its ships to be engaged in the transport of troops and vital supplies to war devastated areas in the postwar period.

The Company announced earnings of $3,169,891 for the year 1944 as against $3,081,149 in 1943.

* * *

SCHOOL FOR CHEMICAL ENGINEERS

A new chemical engineering college is being planned in the city of São Paulo. Father Saboia de Medeiros spent several months in the United States studying the organization of the most important chemical engineering colleges in order to found a modern and up-to-date educational institution under the sponsorship of the Catholic University of Brazil. Industrial organizations in São Paulo are studying what help should be extended to the new college, which is considered to be of great necessity to the large industrial field in Brazil.

QUALITY OF BRAZILIAN WINES IMPROVES

Advanced wine making techniques as well as the introduction of better varieties of grapes are gradually raising the standard of Brazilian wines. Rehabilitation of old vineyards is under way, though they still represent about 80 percent of the total cultivation.

European varieties already have been introduced into Brazil with encouraging results. At Caldas, in the State of Minas Gerais, the "Rhine Riesling" and the "Golden Muscatel," the "Italian Muscatel" and the "Sirah" are grown satisfactorily. Mixed varieties have also been cultivated there, such as the "Seibel 10096" and "6905." The volcanic soil of that region is the most suitable for producing wines of the finest qualities.

In the State of São Paulo there are vineyards of the "White Pinot de Chardonnay," the "Madresfield Curt," the "Hamburg Muscatel" and the "Black Diamond." The Red "Seibel 10096" and "6905" and the White "Seibel 5213" are largely cultivated in the districts of Jundiaí, São Roque and Salto-do-Itú.

In the states of Paraná and Santa Catarina grape growers prefer the "Trebino," the "Frankental" and some "Muscatel" varieties, especially the "Muscatel of Alexandria" and the "Dattier of Beyrouth."

The State of Rio Grande do Sul is the largest wine producing center where 80 percent of all Brazilian vineyards are located. The varieties of grapes cultivated there are: "Bonarda," "Merlot," "Cabernet," "Barbera," "Trebiano," "Peverela," "Malvasia" and some "Muscatel" types.

The districts of Bento-Gonçalves and Garibaldi are well-known white-grape country. The finest red grapes are grown in the districts of Caxias, Farroupilha and Flores da Cunha.

The best Brazilian champagne comes from the district of Garibaldi where the "Malvasia" and "Trebiano" grapes are grown.

Technical assistance to wine-growers has been provided by the Brazilian Government since 1937, when the Laboratorio Central de Ecologia was created. The Laboratorio has been responsible for raising the quality of Brazilian wines in recent years.

Brazilian wine production in the years 1940, 1941 and 1942, is shown in the following table by principal producing states.

STATES	*1940 Liters*[1]	*1941 Liters*[1]	*1942 Liters*[1]
Ceará	5,000		
Rio de Janeiro	9,000	10,000	11,000
São Paulo	5,900,000	2,000,000	2,000,000
Paraná	850,000	1,070,470	1,017,450
Santa Catarina	5,294,000	4,895,180	5,106,730
Rio Grande do Sul	65,000,000	19,045,980	78,485,740
Minas Gerais	4,432,000	4,178,290	3,506,430
TOTAL	81,490,000	31,200,020	90,127,350

[1]One liter=1.06 quarts.

The value of wine production in 1940 was 49,563,000 cruzeiros; in 1941, 27,861,000 cruzeiros; and in 1942, 60,075,000 cruzeiros.

MARKET FOR LEAD ARSENATE

Imports of lead arsenate into the São Paulo area of Brazil average about 1,000 metric tons annually, and consumption ranges between 500 and 2,000 tons. This material is used almost exclusively for insecticidal protection of the cotton crop and is consumed principally from October to March. The bulk of the Brazilian consumption is in the São Paulo region.

Lead arsenate is produced by one firm in the São Paulo district, but domestic requirements have been supplied largely by imports, which amounted to slightly more than 1,000 tons annually between 1937 and 1943. From 1938 to 1942 they had an average yearly value of approximately $250,000. Before the war, Germany, Belgium, the United Kingdom, and Japan were the principal suppliers. The United States entered the Brazilian market in 1939 and since 1941 has been the leading and practically the only source for lead arsenate.

The amount of lead arsenate consumed annually depends upon the activity of a type of leaf worm which attacks the cotton plant. Approximately 1,500 tons of the insecticide were used in the 1941-42 crop season, while consumption declined to less than 500 tons in each of the two following seasons, because of the relative inactivity of the pest. Stocks are believed sufficient for the present crop year.

Purchasing follows a seasonal pattern, about 30 percent being bought in the period July-September, 50 percent during the following 3 months, and 20 percent in the January-March period. Consumption trends are also seasonal, 40 percent being used during the 3 months October-December, 50 percent in January-March, and 10 percent in April-June. Although consumption of lead arsenate during the past 2 seasons has declined, the long-range trend is believed to be upward, because the area devoted to cotton has been increasing each year.

The principal output of the São Paulo firm which manufactures lead arsenate consists of aluminum arsenate, which the producer claims to be as effective as lead arsenate, having the same arsenious-oxide content—approximately 30 percent. This manufacturer's 1941-42 production was approximately 60 percent aluminum arsenate, 35 percent lead arsenate, and 5 percent calcium arsenate. The advantage of aluminum arsenate seems to lie in the difference in price between the raw materials, aluminum sulfate and lead.

Future participation of the United States in the São Paulo market for lead arsenate depends on the price factor and on the extent to which domestic production meets the demand.

BEESWAX IMPORTANT TO WAR EFFORT

Over half of the total beeswax consumed in the United States now comes from abroad, with Brazil ranking as one of the principal suppliers.

Brazilian exports of beeswax, in 1943, amounted to 447 tons, valued at $495,800, and during the first six months of 1944, 279 tons valued at $223,350.

The largest user of beeswax is the cosmetic and pharmaceutical industry. In the last twenty-five years, the production of cosmetics has increased tremendously. Typical cold creams contain from 8 to 15 percent beeswax. It is very likely that this industry has done much to maintain the total consumption of beeswax while others were discarding it in favor of less expensive materials and substitutes. Cold creams, lipsticks, pomades, eyebrow pencils, rouge, deodorant sticks, ointments, salves, and other cosmetics and pharmaceuticals contain beeswax in many of their formulae.

The second largest use for beeswax is the production of church candles. Nearly all church candle manufacturers make three classes of beeswax candles—a 51 percent, a 60 percent, and a pure beeswax candle.

The third largest use for beeswax is the production of bee comb foundation. The sheets of foundation are placed in frames by beekeepers and inserted in the beehives where they become the mid-rib of the combs. In this process these combs become the source of future supplies of beeswax.

Beeswax is used only to a limited extent in polishes. It has been almost completely replaced by carnauba wax from which polishes are made not requiring buffing.

Modeling wax containing beeswax is still used to some extent in the design of scientific specimens by museums and universities. It has been almost completely replaced by modeling clays in schools and art centers.

In the insulation field beeswax is used to a limited extent in electrical embedding. There are numerous minor uses such as in acid bottles, water-proofing, grafting compounds, leather dressings, lubricants, carbon paper, adhesive compositions, sealing wax, and thread wax.

In the early years of the present war, there was a shortage of beeswax in the United States. Due to ship sinkings along the Atlantic seaboard, space was reserved on vessels for materials more critically needed in the war effort. The need of beeswax for the armed forces and essential industry soon made it apparent that domestic production would be greatly depleted. It also became apparent that beeswax, generally regarded as a by-product, was actually more important than honey.

The exact amount of beeswax required by the armed forces and essential industry is not revealed for security reasons. The amount has been estimated, however, at upwards to a million pounds annually. Beeswax is used as a protective coating on ammunition, airplanes, and other articles, and in chemical warfare.

MAKE ANHYDROUS AMMONIA

In 1942, Companhia Nitro-Quimica Brasileira, an important manufacturer of nitro-cellulose rayon and gun cotton in Brazil, began production of anhydrous ammonia. While the quality is not believed to equal that of the United States product, it has been accepted by Brazilian consumers and has supplied an important part of local requirements from the time production started. The company is completing an additional unit which will double its production. Anhydrous ammonia is used in the São Paulo district almost exclusively as a refrigerant. About 50 percent of total consumption is by meat packers, 20 percent goes to breweries and ice manufacturers, and 15 percent to chemical and textile plants. Of the remaining 15 percent, 10 percent is used by the dairy industry and 5 percent for miscellaneous purposes.

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SHIPBUILDING COMPANY STARTED

Construções Navais Monica, S. A., is being organized in Rio de Janeiro, Brazil, with a capital of $1,000,000 (U. S. currency) for the purpose of building various kinds of ships needed in Brazil's maritime service. This company expected to begin construction of shallow-draft wooden boats for coastal and river trade. In order to make the fullest use of national materials, steel construction is to follow when plates, shapes, and materials become available.

BOTTLE PRODUCTION RISES

Production of bottles for the wine industry in São Paulo is increasing, according to recent reports, despite the fact that present local manufacture is not yet sufficient to take care of the demand.

Approximately half the bottles used in the wine industry are of the 660-gram size; 25 percent of 1,000 grams; 20 percent, 330 grams; 4 percent, 3,000 grams; and the remaining 1 percent of miscellaneous sizes. The 80-gram bottle recently introduced for Vermouth is proving very successful.

The most common color of glass used by wine producers is green. Plain white glass is utilized to some extent, but very little brown. At present, prices are about 40 percent higher than normal and range from 0.60 cruzeiro for the 330-gram size to 4 cruzeiros for champagne bottles. United States bottles would be too expensive to use in normal times in São Paulo.

Imports of bottles through the port of Santos during the period 1938 to 1944 ranges from 45,535 kilograms valued at 478,841 cruzeiros in 1938 to 3,665 kilograms in 1943 and 4,340 kilograms in the first 10 months of 1944. Germany and Czechoslovakia were the chief suppliers in 1938, sending 37,779 and 4,848 kilograms, respectively. Since 1939 the United States has supplied the major portion of bottle imports and in 1943 and 1944 was the sole supplier.

TRADE OPPORTUNITIES

The Brazilian Government Trade Bureau has received the following inquiries from businessmen in Brazil, who desire to export or import the products listed below. We suggest that the parties interested write directly to these firms, via airmail, as well as to this Office, at 551 Fifth Avenue, New York 17, N. Y.

The following Brazilian firms wish to Export to the United States:

- **Essential Oils: Orange, Lemon, Sassafras; Copra and Castor Oils**—Valdomiro T. Barros, Caixa Postal 609, São Paulo, Brazil.
- **Animal Glue; Shelled and Unshelled Brazil Nuts; Grated Coconuts; Dried Tripe; Oakum; Andiroba Oil** (for the manufacture of soap); **Piassava Fiber** (for brooms); **Manioc Flour; Tapioca Flakes; Tonka Beans**—Silva Fontes & Cia. Ltda., Rua Conselheiro Saraiva 14, Rio de Janeiro, Brazil.

The following Brazilian firms wish to Import from the United States:

- **Novelties (Compacts, Cigarette-Cases, Lighters, Lower-Priced Costume Jewelry, etc.)** for complimentary distribution, to be given out by an Advertising Company during the Christmas Season—Organização Norte Brasileira de Publicidade, Rua Imperial 1815, Recife, Pernambuco, Brazil.
- **Essences and Bases for the Perfume Industry**—Cyrillo R. de Souza, Rua da Penha 75, Recife, Pernambuco, Brazil.

The following Brazilian firms wish to Represent American manufacturers and exporters:

- For the sale of **Tinplate; Barbed Wire (Iowa Type); Galvanized Black Iron Plates; Galvanized Iron Tubes; Galvanized Plain Iron Wire; Steel Bands for Baling Cotton; Shellac; Spices; Wheat Flour; Pharmaceutical Products; Optical and Surgical Supplies**—Schenker, Rodrigues & Cia., Rua do Apolo 153, Recife, Pernambuco, Brazil.
- For the sale of **Chemical and Pharmaceutical Products; Iron, Steel and Aluminum Goods; Textiles; Electrical Supplies; Hardware; Automobiles, Trucks and Accessory Parts; Radios and Victrolas; Refrigerators (Domestic and Commercial); Typewriters**—Galeão & Pinheiro, Rua Virgilio Damazio I, Salvador, Bahia, Brazil.
- For the sale of **Costume Jewelry in General; Wrist Watches; Plastics; Alarm Clocks; Fine Optical Goods.** Also wishes to import for his own account—A. Feital & Cia., Largo da Carioca 5, Rio de Janeiro, Brazil.
- For the sale of **Perfumes; Beauty Preparations and Cosmetics.** This firm would like to act as distributors for American manufacturers, as well as to import for their own account—Perfumaria Bijou, Rua Nova 229, Recife, Pernambuco, Brazil.
- For the sale of **Machinery and Hardware; Precision Instruments; Chemical and Pharmaceutical Products; Wines; Beverages and Foodstuffs**—Reprint Soc. de Representações Internacionais Ltda., Rua da Candelaria 9, Rio de Janeiro, Brazil.
- For the sale of **Drugs and Pharmaceuticals; Surgical Supplies**—Veloso, Botelho & Cia. Ltda., Rua Estácio de Sá 90, Rio de Janeiro, Brazil.
- For the sale of **Paper in Bulk; Office and Personal Stationery; Copy Paper (White and Other Colors); Air Mail Paper; Bond and Glossy Magazine Paper.** This firm also wishes to import **Urgently: Air Mail and Copy Paper** for their own account—Soc. Importadora e Exportadora Ltda. Seival, Avenida Rio Branco 183, Rio de Janeiro, Brazil.
- Mr. Moacyr V. Martins, of Byington & Cia., São Paulo and Rio de Janeiro, Brazil—is now in the United States, interested in securing representation of reliable American Manufacturers (not exporters) of **Heavy-Duty Machinery; Electrical Supplies; Railroad Equipment; Signalling Equipment for Railroads; Electric Motors and Generators; Single-Phase and Tri-Phase Motors; Diesel Enterprise Motors.** While in this country, Mr. Martins may be reached at the New York Office of Byington & Company, 165 Broadway, New York 6, N. Y.
- **Dental X-Rays; Common X-Ray Equipment; Dentists' Instruments in General; Surgical Supplies; Hypodermic Needles and Thermometers**—Eliseu Duarti, Rua Floriano Peixoto 814, Fortaleza, Ceará, Brazil.
- **Machinery for the Leather Goods and Leather Tanning Industries; Printing and Engraving Machinery; Books**—Also interested in exporting to the United States: **Brazilian Raw Materials; Hides and Skins; Animal Glue, Hair and Other By-Products**—Alfredo Lheureux, manager of Cortume Barreiros, Caixa Postal 124, in Florianópolis, Santa Catarina, Brazil.